WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

an interconnect layer provided on a semiconductor substrate;

a protective film provided on said interconnect layer; and

an electrode pad provided on said protective film,

wherein said semiconductor device comprises an anti-oxidizing layer containing a different element which is different from an element contained in said interconnect layer, said anti-oxidizing layer being disposed between said interconnect layer and said protective film.

2. The semiconductor device according to claim 1, wherein said interconnect layer is a copper-containing metal.

3. The semiconductor device according to claim 1, wherein said different element is a metal having lower oxidation-reduction potential than that of a metal contained in said interconnect layer.

4. The semiconductor device according to claim 3, wherein said different element is a group IV element or a group VI element in long form periodic table.

5. The semiconductor device according to claim 4, wherein said different element is Ti or Si.

6. The semiconductor device according to claim 1, wherein said protective film includes a Ti layer or a TiN layer.

7. The semiconductor device according to claim 1, wherein said anti-oxidizing layer is a layer where the upper part of said interconnect layer is modified, and comprises said different element and an element contained in said interconnect layer.

8. A method for manufacturing a semiconductor device,

comprising:

forming an interconnect layer on a semiconductor substrate;

forming a protective film on said interconnect layer;

forming an anti-oxidizing layer between said interconnect layer and said protective film, by thermally diffusing a different element on the surface of said interconnect layer, said different element being an element contained in said protective film and being different from an element contained in said interconnect layer; and

providing an electrode pad on said protective film.

9. A method for manufacturing a semiconductor device, comprising:

forming an interconnect layer on a semiconductor substrate;

irradiating a plasma onto a surface of said interconnect layer to form an anti-oxidizing layer on a surface of said interconnect layer, said plasma containing a different element which is different from an element contained in said interconnect layer;

forming a protective film on said interconnect layer; and

providing an electrode pad on said protective film.

10. The method according to claim 8, wherein said forming said interconnect layer contains forming a copper-containing metal layer.

11. The method according to claim 9, wherein said forming said interconnect layer contains forming a copper-containing metal layer.

12. The method according to claim 8, wherein said different element is a metal having lower oxidation-reduction potential than that of a metal contained in said interconnect layer.

13. The method according to claim 9, wherein said different element is a metal having lower oxidation-reduction potential than that of a metal contained in said interconnect layer.

14. The method according to claim 12, wherein said different element is an element contained in the group IV or the group VI in long form periodic table.

15. The method according to claim 13, wherein said different element is an element contained in the group IV or the group VI in long form periodic table.

16. The method according to claim 14, wherein said different element is Ti or Si.

17. The method according to claim 15, wherein said different element is Ti or Si.

18. The method according to claim 8, wherein said forming said protective film contains forming Ti layer or TiN layer.

19. The method according to claim 9, wherein said forming said protective film contains forming Ti layer or TiN layer.